Laurel Run #1 Passive System Rehabilitation

A Blacklick Creek Watershed Association Project

Center Township, Indiana County, PA
Grant Contract Number: C990002524

https://blacklickcreekwatershed.org

Before/During Rehabilitation: (From Left to Right) One of the original VFPs prior to rehab with its long narrow design (left), Laurel Run downstream from the system at Aulds Run Road prior to rehab (middle - left), installment of underdrain system in JVFP1 (middle – right), wetland/final component of LR #1 post-rehab with established vegetation and a rock distribution berm to distribute flow (right).

Stream Order: Laurel Run → Blacklick Creek → Conemaugh River → Kiskiminetas River
Project Sponsor: Stream Restoration Incorporated (www.streamrestorationinc.org)
Problem: The Laurel Run #1 (LR#1) passive system treating AMD in Laurel Run, a tributary in the Blacklick Creek Watershed, was nearing the end of its expected lifetime and had been experiencing decreased treatment effectiveness as well as other issues causing a portion of the AMD to bypass the system.
Goal: To rehabilitate the Laurel Run #1 passive system to provide continued and improved treatment performance that had been achieved through initial installation while maximizing the use of the existing footprint and recovering existing limestone as possible.

Project Description: The Laurel Run #1 (aka North) Passive System (coordinates 40.508236, -79.112892) was originally constructed in 2001 as part of a public-private partnership effort between the Blacklick Creek Watershed Association (BCWA) and Stream Restoration Incorporated (SRI) which provided immense benefits to Laurel Run and Blacklick Creek for nearly two decades by neutralizing ~51,000 lb. acidity and removing ~ 6,000 lb. of metals per year. The original treatment system consisted of a collection and piping system to collect and convey AMD emanating from an abandoned underground mine drain to two long rectangular vertical flow ponds (VFPs) in parallel, followed by a 0.6-acre aerobic wetland. Monitoring and maintenance of the system was conducted by BCWA and SRI. Changes to the system occurred around 2012-2014 when Amerikohl Mining re-mined the area and added a new flow splitter box, conveyance piping, and a third VFP as part of the permit conditions. An evaluation of the system in 2018 found decreased treatment performance due to permeability of VFPs, short-circuiting, gas traps, and other issues as well as AMD bypassing the system. A decision was made to seek funding for rehabilitation which would provide an opportunity to improve upon the design using the most recent understanding of passive treatment, improving treatment capacity and effectiveness. A grant was received in 2020. During the design process multiple new AMD discharges were found to have developed across the site instead of distinct source from the underground mine drain and most were completely bypassing the system. Construction to rehabilitate the Laurel Run #1 passive system began in summer of 2024. A 190-linear-foot collection channel (CC) and a 350-linear-foot terraced iron formation (TIF) were used to capture the numerous AMD discharges. The TIF also functions to promote iron removal at low pH through naturally occurring biogeochemical processes. The original VFPs were redesigned and configured into three mixed media Jennings-type VFPs (JVFPs) with each containing a mixture of 1,600 tons limestone, 800 CY woodchips, and 400 CY spent mushroom compost. In addition, about 3,100 tons of limestone were recovered from the original VFPs, washed, and reused within the underdrains of the new JVFPs. A new flow splitter box was installed to evenly split the AMD into each JVFP. The final component of LR#1, the 0.6-acre aerobic wetland, was cleaned of sludge and vegetation during rehab and had a rock distribution berm added to distribute flow evenly, minimizing short-circuiting. Construction and rehabilitation was completed in early 2025. The newly rehabilitated system treats an estimated 275 million gallons of AMD, neutralizes 60,000 lb. of acidity, and prevents 10,000 lb. of metals from entering Laurel Run each year while providing an estimated load of >90,000 lb. of excess alkalinity.

After Rehabilitation: Terraced Iron Formation (TIF) collects, conveys and provides initial treatment step of multiple AMD discharges.

Project Partners

PA Department of Environmental Protection Bureau of Abandoned Mine Reclamation ($782,854 Growing Greener Grant) |U.S. Office of Surface Mine Reclamation and Enforcement ($100,000 WCAP Grant)|Foundation for Pennsylvania Watersheds ($20,000 Grant)| |Stream Restoration Incorporated ($126,731 In-Kind; Grant Administration, Project Management & old limestone)|BioMost, Inc. ($94,633 In-Kind; Design/Permitting & Construction Oversight) |PA Game Commission (Landowner) |Wensell Family (Landowner) |Blacklick Creek Watershed Association (Water Monitoring, Project Assistance and Education/Outreach) |CVC Stream Team Team (Water Monitoring) |Joseph C. Puryear Trucking & Excavating Inc. (Construction)